



LIST OF THE CLAIMS

Claims 1-15: (canceled).

16 (Amended): A process for producing a semiconductor device to be mounted on a substrate by flip chip bonding comprising electrodes formed on a semiconductor chip, and bumps each consisting of a spherically formed metal ball having ~~a given size~~ a diameter of not greater than 150 micrometers, and adhesive bonded to the electrodes (8) for the attachment of the bumps, wherein each electrode (8) includes a layer of an electrode material (5) and at least one layer (6, 7) laminated to the layer of the electrode material (5) to avoid deterioration of bonding such that the at least one layer (6, 7) has peripheral dimensions substantially the same as or larger than those of the electrode material (5); said process comprising:

adhesive bonding the metal balls to the electrodes with a flux without reflowing the metal balls, whereby the metal balls are only bonded to the electrodes with flux without reflowing.

17 (Amended): A process for producing a semiconductor device to be mounted on a substrate by flip chip bonding comprising electrodes formed on a semiconductor chip, and bumps each consisting of a spherically formed metal ball having ~~a given size~~ a diameter of not greater than 150 micrometers, and adhesive bonded to the electrodes (8) for the attachment of the bumps, wherein each electrode (8)

includes a layer of an electrode material (5) and at least one layer (6, 7) laminated to the layer of the electrode material (5) to avoid deterioration of bonding such that at least one of the at least one layer (6, 7) has a thickness which is smaller than that of the electrode material (5) and the at least one layer (6, 7) has peripheral dimensions substantially the same as or larger than those of the electrode material (5); said process comprising:

adhesive bonding the metal balls to the electrodes with a flux without reflowing the metal balls, whereby the metal balls are only bonded to the electrodes with flux without reflowing.

18 (previously presented): The process according to claim 16 or 17 comprising:

applying the flux to the electrodes.

19 (previously presented): The process according to claim 16 or 17, wherein the metal balls are adhesive bonded to the electrodes by a process comprising the steps of:

applying a vibration at a small amplitude to a vessel containing the metal balls to cause the metal balls to jump up;

arranging and holding the metal balls on an arrangement base plate by attracting the jumping up metal balls to attraction openings provided in the arrangement base plate in positions corresponding to the electrodes of the

semiconductor chip to which the metal balls are to be adhesive bonded;

removing excess metal balls adhering either to the arrangement base plate or to the metal balls attracted to the attraction openings; and

simultaneously contacting the metal balls held and arranged on the arrangement base plate with the electrodes of the semiconductor chip.

Claims 20-24: (canceled).

25 (previously presented): A semiconductor device produced by the process of claim 16 or 17, provided with bumps consisting of metal balls adhesive bonded to the respective electrodes of the semiconductor chip.

Claim 26: (canceled).